NOAA Scientific Publications Report
July 13 – July 27, 2012

Contents

1. HIGHLIGHTED ARTICLES

1a. Title: Modeling of 2011 Japan tsunami - Lessons for near-field forecast
Journal: Pure and Applied Geophysics
Authors: Yong Wei (PMEL/JISAO), **Chris Chamberlin** (PMEL/JISAO and currently at Amazon), **Vasily V. Titov** (PMEL), **Liujuan Tang** (PMEL/JISAO), **Eddie N. Bernard** (PMEL, retired)
Publication Date: Aug-Sept 2012

Summary: The paper is the first thorough evaluation of NOAA's tsunami forecast methodology for near-field tsunamis using the wealth of measurements along the entire east coastline of Tohoku, Japan. The study suggests that real-time forecast of tsunami flooding in the near field is becoming achievable with the technology and the methodology already in place.

Important conclusions:

- Measurements from GPS buoys and wave gauges offshore of Japan show excellent agreement with the model results obtained using NOAA's real-time tsunami source
- The computed tsunami run-up height and spatial distribution is highly consistent with post-tsunami survey data collected throughout the entire Japanese coastline.
- The computed inundation penetration gives a modeling accuracy of 85.5%, in comparison with the post-tsunami survey results, for the inundation area along 800 km coastline of Japan.

Significance: An accurate tsunami flooding forecast within 30 minutes may now be possible using the NOAA forecast methodology with carefully placed tsunameters and large-scale model employing powerful computing capabilities. It is likely the progress in tsunami detection and modeling can further reduce the forecast time to 15 to 20 minutes.
Press release/Roll out plan: Yes

1b. Title: Long-term decline of global atmospheric ethane and implications for methane
Journal: Nature
Authors: Isobel Simpson (UC Irvine), Mads Sulbaek Anderson (UCI, Jet Propulsion Laboratory/CalTech), Simone Meinardi (JPL/CalTech), **Lori Bruhwiler** (NOAA Earth System Research Laboratory), Nicola Blake (UCI), Detlev Helmig (University of Colorado Boulder), Sherwood Rowland (UCI), Donald Blake (UCI).
Publication Date: mid to late summer 2012

Summary: The authors investigate long-term trends in two linked atmospheric gases: methane and ethane, to better understand what has been happening to global levels of the former, an important greenhouse gas. Methane concentration in the atmosphere grew in the 1980s, but that growth slowed in the 1990s and nearly stalled in the early 2000s (with strong inter-annual variability in growth rate). The authors show that global ethane emissions dropped about 21 percent from 1984-2010, and they attribute that drop to a decrease in venting and flaring emissions of natural gas in oil fields, following a peak in the 1960s and

1970s. The relationship between ethane and methane levels suggests that reduced fossil fuel emissions have likely contributed to the decrease of the methane growth rate.

Important conclusions:

- Reduced emissions of methane from fossil fuel exploration and development activities explain part of a recent slowdown in the growth rate of that important greenhouse gas since the early 1980s.
- Methane is not decreasing in the atmosphere; but its growth rate has been slower in recent decades than in the 1980s.
- While there has been some speculation about a decrease in microbial activity, especially activity associated with rice agriculture; this paper suggests fossil fuel emissions changes may explain 30-70% of the methane growth rate slowdown.

Press release/Roll out plan: coordinating with UC Irvine

2. ADDITIONAL ARTICLES

Top Tier Journals

2a. Title: Nonlinear climate response to regional brightening of tropical marine stratocumulus
Journal: Geophysical Research Letters
Authors: Spencer Hill and **Yi Ming** (OAR/GFDL)
Publication date: August 2012

Summary: The authors simulated cloud seeding, using the GFDL AM2.1 atmospheric model coupled to a mixed-layer ocean. Using a version of the model that incorporates the aerosol indirect effects, sea salt concentrations were increased by five in the boundary layer, over three marine subtropical regions which feature persistent low level cloud cover due to subsidence.
Important conclusions: Seeding clouds in three tropical marine regions cools earth's globally-averaged surface temperature by 0.5 degrees Celsius, which is roughly in line with prior modeling studies. Climate responds non-linearly to cloud seeding in different equatorial regions, with globally-averaged temperature being much more sensitive to cloud seeding over the southeastern Pacific than either the south Atlantic or northeastern Pacific.

Intermediate-Tier Journals
None

Regional/Highly Specialized Journals
None

3. OTHER REPORTS, BOOK CHAPTERS, AND INTERNAL PUBLICATIONS
None